



## AN INVENTORY OF HYDRATE-RELATED GAS SEEPS IN LAKE BAIKAL

**P. Van Rensbergen** (1), M. De Batist (1), W. Criel (1), J. Klerkx (2), N. Granin (3),  
R. Gnatovsky (3) & P. Krinitsky (4)

(1) Renard Centre of Marine Geology, Ghent University, Ghent, Belgium  
(pieter\_vanrensbergen@yahoo.com), (2) IBES, Brussels, Belgium, (3) Limnological Institute  
of SB-RAS, Irkutsk, Russia, (4) SONIC, St.Petersburg, Russia

Lake Baikal in Siberia, one of the world's largest rift lakes, is known to be the only fresh-water lake with gas hydrates in the subsurface. Seismic data clearly image the base of the hydrate layer in the Central and Southern Baikal Basins, at both sides of the Selenga delta. Gas seeps and short-lived mud volcanoes were discovered in Lake Baikal's South Basin at places where the gas hydrate layer shows anomalous thickness variations, which was attributed to localized heat flow anomalies along active fault segments. The gas seeps were interpreted as the result of localized destabilization of gas hydrates by injected thermal water along fault segments; it is probably the inevitable consequence of gas hydrate accumulation in an active rift basin.

New data from Lake Baikal's Central basin, acquired during the summer of 2002, show that the four seeps in the South Basin are not isolated cases. More seeps were discovered, all situated in Baikal's hydrate accumulation area, all near active fault segments, and all associated with anomalous thickness variations of the underlying hydrate layer. This poster gives an overview of the occurrence of gas seeps in Lake Baikal in relation with thickness anomalies of the gas hydrate layer. The gas seeps in Lake Baikal were found in three areas: 1. Posolsky fault area. Four methane seeps were encountered in the footwall of a small antithetic fault of the Posolsky fault zone. The seeps occur as blow-out craters and conical mud volcanoes. 2. Olkhon fault splay area. Two gas seeps, St.Petersburg and Novosibirsk, were discovered in 2002 at the footwall of a splay of the large Olkhon border fault. The seeps appear to be conical mud volcanoes. 3. The Kukuyu canyon area. The Kukuyu canyon is a large, probably fault-related, canyon, at the northern slope of the Selenga delta. Gas seeps are docu-

mented on side scan sonar data and subbottom acoustic profiles.

The newly discovered seeps support the interpretation that gas seeps and mud volcanoes in Lake Baikal are caused by the localized dissociation of gas hydrates by thermal input at the base of the hydrate layer. Seepage is probably intense but short-lived, and sometimes accompanied by mud extrusion at the lake floor. They are a rare example where hydrates are the source for intense methane venting, and not vice versa.